

Roger L. Olsen, Ph.D.

Senior Vice President

Senior Geochemist

Camp Dresser & McKee

Education

Ph.D. - Geochemistry, Colorado
School of Mines (1979)

B.S. - Mineral Engineering
Chemistry, Colorado School of
Mines (1972)

Dr. Olsen has more than 30 years of experience in the conduct, planning, and management of comprehensive sampling programs for soils, sediments and water; treatability studies; implementation of quality control procedures; evaluation of environmental impacts; evaluation of environmental data; design/engineering of remediation systems; and remediation costs analysis. His experience includes evaluations on over 100 sites contaminated with inorganic constituents including metals, arsenic, and nutrients; 30 RCRA sites; and remedial investigation/feasibility study (RI/FS) studies at more than 150 Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) sites. Dr. Olsen is a recognized expert in the evaluation and modeling of chemicals in surface water, groundwater, soils, and sediments. Dr. Olsen is the author of over 120 publications or presentations. He has presented expert testimony in 20 cases concerning the fate/transport of inorganic and organic chemicals in the environment and evaluation/cost of remedial systems. Because of his broad experience and technical expertise, Dr. Olsen is routinely requested to assist in scoping and planning overall environmental evaluations, strategies and remediation at sites.

Examples of Dr. Olsen's recognition as an expert in the area of environmental evaluations and strategic planning are the variety of committees and projects he works on. Some of these include:

- National Research Council's Committee on Innovation in and Commercialization of Ground Water Remediation. Dr. Olsen has completed this 3-year appointment. He was subchairman of the section on testing and methodology for innovative systems.
- Presumptive Remedy for Metals in Soils. Dr. Olsen was selected by EPA to review and write sections of the new Presumptive Remedy for Metals in Soils. The draft of this guidance is under review.
- Protocol for Implementing Intrinsic Remediation. Dr. Olsen was one of three experts selected by EPA to review the draft document: "Technical Protocol for Implementing Intrinsic Remediation with Long-Term Monitoring for Natural Attenuation of Fuel Contamination Dissolved in Ground Water" issued by the Air Force.
- Dr. Olsen was an Invited speaker at U.S. EPA's Workshop on Managing Arsenic Risks to the Environment: Characterization of Waste, Chemistry and Treatment and Disposal.

Dr. Olsen has also recently received awards for his projects. These include:

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- American Academy of Environmental Engineers' Superior Achievement Award (top prize) for the Wichita Area Treatment, Education and Remediation (WATER) Center (treatment/reuse of contaminated groundwater)
- The National Ground Water Association Outstanding Ground Water Project Award, Gilbert-Mosley Groundwater Remediation System
- American Academy of Environmental Engineers' Grand Prize in the Planning Category for Innovative Approaches at the Gilbert-Mosley Site
- American Academy of Environmental Engineers' Grand Prize in the Design Category for the Brooks Landfill Air Sparge System
- American Consulting Engineer's Council National Honor Award for Passive Treatment of Acid-Mine Drainage
- American Consulting Engineer's Council National Honor Award for the WATER Center
- American Consulting Engineers' Council National Honor Award for Bioremediation Pilot Plant
- American Academy of Environmental Engineers' Grand Prize in the Research and Development Category for Bioremediation Pilot Plant
- Civilian Research and Development Foundation Award for Best Project and Project Contributing to the Overall Improvement of Mankind (one of eight selected)

Dr. Olsen is skilled in the application of state-of-the-art chemical evaluation tools and transport models to assess surface water and ground water impacts resulting from waste disposal. He has applied these evaluation tools and models on 50 migration assessments. Recently, Dr. Olsen was the technical director of the modeling efforts to evaluate the potential impact on groundwater due to application of herbicides on grass and pasture lands in Ireland. State of the art models developed by the European Union were used to predict runoff, infiltration and percolation and to evaluate environment fate/transport of the compounds. Dr. Olsen is the author (or co-author) of over 120 publications/presentations. He has recently co-authored papers on the adsorption behavior of arsenic, desorption characteristics of TCE, the geochemistry and treatment of chromium, speciation of lead in soils and identification of PRPs, metal distribution in streams, and comparison of methods to analyze metals in surface waters. Dr. Olsen has presented expert testimony in 20 cases on the fate and transport of inorganic and organic chemicals in the environment and the evaluation/cost of remedial technologies.

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Dr. Olsen has performed assessments at over 30 sites with contaminated sediments. As part of a natural resource damage claim, he directed the technical team that collected and evaluated sediment samples in the Panther Creek Basin in Idaho. Evaluations were performed using XRF, electronmicroprobe and leaching techniques to identify sources of metal contamination and to quantify the contribution from each source. In addition, the evaluations were used to determine fate/transport of the metal and impact on the environment. The metals of concern were lead, arsenic and copper. Dr. Olsen was also the technical director for the fate/transport and statistical evaluations of contaminated sediments in the Calcasieu River Basin. Over 580 sediment samples were collected and analyzed for inorganic and organic compounds.

Dr. Olsen has performed evaluations concerning surface water quality at over 100 sites. For the EPA, Dr. Olsen served as technical advisor for a project characterizing the nature and extent of contamination within several hundred miles of mountainous terrain in Montana. These watersheds contain over 350 potential sources of contamination. The focus at this site was to evaluate the nature and extent of contamination and to develop an integrated watershed-wide approach for remedial actions to reduce environmental and human health threats. Chemical and sediment fate and transport modeling (WASP and MINTEQ) was used to evaluate loads and predict water quality as a result of various remediation and water management approaches. Batch adsorption and leaching tests were performed to provide site-specific input for WASP.

Dr. Olsen has participated in over 150 RI/FSs at Superfund sites. At seven sites, he has been the project manager responsible for all phases of the project including field investigations, quality control, endangerment assessment, determination of soil cleanup levels, remedial alternative evaluation, determination of applicable standards (ARARs), costs of remediation and Record of Decision (ROD) preparation. Dr. Olsen's projects are consistently given high ratings by EPA and State Agencies for innovative approaches, technical quality, and meeting stringent schedules. At several contaminated sites, Dr. Olsen evaluated innovative stream restoration techniques and tested metal removal using passive biological treatment in artificial wetlands (bench, pilot and full-scale systems).

Dr. Olsen pioneered the use of a variety of evaluation techniques to identify the sources of contamination at sites. Techniques used include speciation of metals and chemicals in soils, sediments and water; identification and analyses of unique constituents; specialized analytical methods; fate/transport modeling; and statistical analyses. He has performed modeling and speciation evaluations to determine sources and evaluate the fate/transport of arsenic, lead and other inorganic constituents on over 30 sites.

Dr. Olsen is a recognized expert in the assessment of the fate and transport of chemicals in the environment, particularly in soil, sediment and ground and surface water systems. In particular, he has evaluated the transport of lead, mercury, arsenic, chromium, zinc, trichloroethene (TCE), vinyl chloride (VC), EDB, benzene, toluene, ethylbenzene, and xylene (BTEX), polychlorinated biphenyls (PCBs), dioxins, pesticides, nutrients and many other chemicals. These evaluations include laboratory testing (batch and column studies) to

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determine partition coefficients and soil cleanup levels, thermodynamics modeling, speciation studies, and desorption studies to accurately predict aquifer restoration times and cleanup costs.

Dr. Olsen is a recognized expert in the area of planning, negotiating, and implementing innovative investigations and remediation approaches. Recent examples of innovation and cost-saving approaches accomplished by Dr. Olsen follow:

- At the Gilbert-Mosley site in Kansas, hydraulic containment and alternative concentration levels for groundwater cleanup were accepted by regulatory agencies. This resulted in a 40 percent reduction of the amount of groundwater requiring remediation and an estimated cost savings of \$8 million.
- At the Leadville Superfund site, onsite XRF analyses were performed for metal contaminated soil. The rapid turnaround results were analyzed geostatistically to determine accuracy of extent of contamination and location of samples. The overall program was reduced from 2 years to 6 months and costs were reduced 50 percent.
- At the Quicksilver site in northern California, bioavailability and electron microprobe studies were performed. As a result, the cleanup standard for mercury in soils was raised by a factor of 12, substantially reducing cleanup volumes and costs.
- Evaluation of metal contamination in soils and stream sediments using electron microprobe indicated the sources of metals were not the result of our client's activities.
- Pilot-scale testing and full-scale implementation of a passive biological treatment system on an acid mine drainage site resulted in considerable cost savings over conventional active treatment methods (pH adjustment/precipitation).

Work Experience

1975 - 1978, Instructor in Chemistry/Geochemistry, Colorado School of Mines

1978 - 1979, Senior Research Chemist, Rockwell International

1979 - 1985, Project Supervisor (final position), D'Appolonia Consulting Engineers and IT Inc. (IT acquired D'Appolonia in 1983)

1985 - Present, Sr. Vice President (current position), Camp, Dresser & McKee, Inc.

Presentations/Publications – Roger L. Olsen

In situ Chromium Treatment: Demonstration Results. Workshop in Actobe, Kazakhstan. Nov. 27, 2007 (with A. Korchevsky)

The Role of Speciation for Metal Impacted Sites. First Annual Environmental Technology and Business Symposium. September 25, 2006.

Remediation and Development of a Former Military Manufacturing and Test Site in Florida USA. Third International Conference on Prevention, Assessment, Rehabilitation and Development of Brownfield Sites. July 19 -21, 2006. Tallinn, Estonia. (with A. Woods and M. Edgar)

Metal Contamination in Soils: Approaches, Remediation and Action Plans. Workshop to the Kazakhstan Environmental Protection Agency. April 5, 2006. Astana, Kazakhstan. (with A. Korchevsky and J. Rasmuson).

Approaches and Standards for Environmental Protection: the Experience in the USA. Presentation to the Kazakhstan Environmental Protection Agency. April 5, 2006. Astana, Kazakhstan. (with A. Korchevsky and J. Rasmuson)

Environmental Health Of lead Uptake Among Infants and Children of Kazakhstan. Presentation to the George Washington University, Department of Environmental and Occupational Health Seminar Series. March 1, 2006. (with J. Rasmuson)

Acid Rock Drainage: Generation, Impacts and Treatment. Presentation to the Ireland Environmental Protection Agency, Geological Survey of Ireland (Department of Communications, Marine and Natural Resources), and Ireland Eastern Regional Fisheries Board (three separate presentations). November 16 - 17, 2005. Dublin, Ireland.

Environmental Health Concerns Associated with Lead Exposure in Children of Kazakhstan. Presentation to the BioGeoScience Colloquium, University of Tulsa. September 22, 2005

Characterization of the Form and Species of Arsenic in Solid and Aqueous Phases to Evaluate Mobility and Treatment. Ground Water Summit Program, National Ground Water Association. April 17 - 20, 2005. (with R. Chappell and K. Whiting)

Environmental Health Problems of Lead Uptake among the Children of Kazakhstan: Assessment and Recommendations. Presentation to the Ministry of Health Care, the Ministry of Environmental Protection, and other educational and government agencies, in Astana and Shymkent, Kazakhstan. January, 2005 (with Rasmuson, J.O., Korchevsky, A. and Hall, D.).

Environmental Health Problems of Heavy Metal Contamination of Environment in Kazakhstan. Presentation to the Collegium of the Environmental Protection Agency of Kazakhstan. December 7, 2004 (with Korchevsky, A. and Rasmuson, J.O.).

Emerging Environmental Contaminants: Perchlorate and 1,4-Dioxane. Presentation to the Los Angeles World Airport Environmental Staff. December 6, 2004.

Chemical Fingerprinting of Hydrocarbons in the Environment. Presentation to the Los Angeles World Airport Environmental Staff. December 6, 2004.

Field Measurements of Groundwater Contaminants using Fiber Optic Enzymatic Biosensors. Annual Meeting of the American Institute of Chemical Engineers, Austin, TX. November 7-12, 2004. (with K.F. Reardon, V. Acha, C.D. Jensen, D.S. Dandy, K.L. Lear, J.J.Eisenbeis)

Water Disinfection Using Electrolytic Generated Silver, Copper and Gold Ions. J Water SRT - Aqua. Vol. 53, pp 567-572, 2004. (with R. Khaydarov, R. Khaydarov and S. Rogers).

In Situ Treatment and Characterization of Arsenic in Groundwater. 2004 Water Quality Conference. Ontario, California. October 27 -29, 2004

Fate and Transport of Ethanol Containing Fuels in the Subsurface. Invited Presentation, Ethanol Workshop. Cosa Mesa, California. July 27, 2004.

Liquid Assets. Publication in Civil Engineering. September 2004. (with P. Anderson and J. Kaufman).

Environmental Remediation and Education in Wichita, Kansas. Proceedings of WEFTEC 2004. (with P. Anderson and J.R. Kaufman).

Demonstration of a Bioavailable Ferric Iron Test Kit . Presented at the Fourth International Conference on Remediation of Chlorinated and Recalcitrant Compounds, Monterey, CA. May 24-27, 2004. (with Pat Evans, Rick Chappell, John Eisenbeis, Mary Trute, Carmen Lebron, John Wilson, Eric Weber, John Kenneke, B.T. Thomas, Tom Dichrisina and John Drexler).

Case Histories and Comparison of two "Brownfields" Sites in Kansas and Indiana USA. Invited Presentation. Proceedings of Brownsfields 2004 Conference. Wessex Institute of Technology. June 15, 2004. (with M. Burgess).

ESTCP Demonstration of a Bioavailable Ferric Iron Test Kit. Poster Presentation at 2004 SERDP (Strategic Environmental Research and Development Program) Conference. 2004. (with Pat Evans, Rick Chappell, Carmen Lebron, John Wilson).

Case Studies of Exposure and Remediation Conducted Resulting from Lead Smelter Emissions. Presentation at the American Industrial Hygiene Conference & Expo 2004. May 11, 2004.

Approaches to Human Health Risk Assessment and Industrial Safety Evaluation in the United States of America and Kazakhstan. Presentation at Workshop on Risk Assessment given to Health Care Officials. Actobe, Kazakhstan. November 7, 2003.

International Approaches and Standards for Environmental Protection: the Experience of the United States of America. Presentation at Workshop on Environmental Management Systems. OJSC TNC Kazchrome, Kazakhstan. November 6, 2003.

Using Groundwater Biogeochemistry to Assess Remediation Goals at a Large, Multi-source Site. Proceedings of the Seventh International In Situ and On-Site Bioremediation Symposium. Orlando, Florida. June 2-4, 2003. (With D. Adams, R. Winslow, A. Bourquin, and D. Brown)

Energy Effective Method of Water and Air Purification From Bacteria. Proceedings of the First International Conference on Environmental Research and Assessment. Bucharest, Romania. March 23-27, 2003. pp 164-170. (With R. R. Khaydarov, R.A. Khaydarov, and S. Rogers)

High-altitude, passive-water-treatment system design and construction for leach-pad effluent. Mining Engineering. 2003. pp 37-40. (With K. Whiting, R. Huffsmith, and D. Adams)

Case Studies: Remediation Around Lead Smelters. Presentations at Symposiums on Lead Health Effects, Toxicity, Remediation and Recommended National Programs. March 27, 2003. Shymkent, Kazakhstan. March 28, 2003. Almaty, Kazakhstan.

Results of Evaluations of Lead Poisoning in Children in Kazakhstan from 1997 to 2002. Presentations at Symposiums on Lead Health Effects, Toxicity, Remediation and Recommended National Programs. March 27, 2003. Shymkent, Kazakhstan. March 28, 2003. Almaty, Kazakhstan.

Case History of a "Brownfields" Site in Wichita, Kansas USA: Innovative Approaches to Groundwater Remediation. First International Conference on Brownfield Sites: Assessment, Rehabilitation and Development. 2002. WITpress, Southampton, England. pp 17-28. (With J. Brown and P. Anderson)

Case History of a "Brownfields" Site in Wichita, Kansas USA: Innovative Approaches to Groundwater Remediation. Invited presentation at Brownfields 2002 International Conference. September 2002. (With J. Brown and P. Anderson)

High Altitude Passive Water Treatment System Design and Construction for Leach Pad Effluent. Paper presented at the 2002 SME Annual Meeting, Phoenix Arizona. February 25-27, 2002. (With K. Whiting, R. Huffsmith, and D. Adams)

Stochastic Modeling of Stormwater and Receiving Stream Concentrations. Presentation at SME Annual Meeting, Environmental Session. February 25-27, 2002. (With R. Chappell and M. Hills)

Use of Fiber Optic Biosensors to Monitor Dichloroethane in Groundwater. International Conference on Remediation of Chlorinated and Recalcitrant Compounds. May 20-23, 2002. (With K. Reardon, W. Willis, M. Herigstad and J. Eisenbeis)

Characterization of the Forms of Arsenic in Soil/Sediments to Evaluate Mobility and Treatment. Invited presentation to U.S. EPA Workshop on Managing Arsenic Risks to the Environment: Characterization of Waste, Chemistry, and Treatment and Disposal, Denver, Colorado. May 1-3, 2001.

Characterization of Sediments to Evaluate Sources and Mobility of Metals and Arsenic. Platform Presentation at International Conference on Remediation of Contaminated Sediments. October 10-12, 2001. (With K. Whiting, R. Chappell, and A. Bourquin).

Techniques to Evaluate the Mobility and Treatment of Arsenic in Soils. Presentation at Conference on Contaminated Soils, Sediments, and Water. University of Amherst. October 22-25, 2001. (With K. Whiting and R. Chappell).

Evaluation of Exposure Pathways and Lead Poisoning in Kazakh Children. Invited Presentation at the CRDF International Symposium. Scientific Cooperation with the Former Soviet Union: Results and Opportunities. Washington D.C. June 8-9, 1999. (With T. Slazhneva).

Blood Lead and Erythrocyte Protoporphyrin Levels in Children in Three Kazakstan Cities. India Journal of Pediatrics. 1999. (With Balkrishena Kaul, et al)

Overview of Reconnaissance of Abandoned Mine Sites, Poster at U.S. Army Corps of Engineers Conference on Restoration of Abandoned Mine Sites, RAMS Conference III, November 15, Reno, Nevada. 1999. (With B. Vince and K. Black).

Overview of Restoration of Abandoned Mine Sites, Poster at U.S. Army Corps of Engineers Conference on Restoration of Abandoned Mine Sites, RAMS Conference III, November 15, Reno, Nevada. 1999. (With B. Vince and K. Black).

Case History of a Successful "Brownfields" Site in Wichita, Kansas. Part 1: Innovative Approaches to Funding and Liability. ASCE Conference Proceedings. 1998. (With M.P. Mitsch and J. Brown).

Case History of a Successful "Brownfields" Site in Wichita, Kansas. Part 2: Innovative Approaches to Remediation. ASCE Conference Proceedings. 1998. (With M.P. Mitsch and J. Brown).

Correctional and Innovative Technology Evaluations for Groundwater Remediation at the Gilbert-Mosley Site in Wichita. Transactions of the 48th Annual Environmental Engineering Conference, University of Kansas, Lawrence. February 4, 1998. (With J.R. Kaufman).

Basic Principles and Results of Biological Monitoring on Lead Influence over Kazakh Children. Problems of Social Medicine and Health Care Management. No. 10, pp. 32-38. Almaty, Kazakhstan. December 1998. (With Tatiana Slazhneva, Andrey Korchevsky, Eduard Granovsky, James Rasmuson, Balkrishena Kaul, and Curt Chanda).

Evaluation of Exposure Pathways of Lead in Kazak Children: Risk Assessment, Biological Monitoring, and Public Health Campaign. Presentation made to CRDF. 1998. Also, Internet World Wide Web <http://frontpage.crdp.inter.net/Abstracts/fund/kb1120.html>.

Aerobic Bioremediation of TCE Contaminated Groundwater: Bioaugmentation with *Burkholderia cepacia* PR1301. Presented at In Situ and On Site Bioremediation Conference, April 28-May 1, 1997. (With D.C. Mosteller, A.W. Bourquin, M.J. Smith, and K.F. Reardon).

Source Identification and Allocation of Metals in Stream Sediments Using Electron Microprobe Techniques. Presented at SME Annual Meeting, February 24-27, 1997. (With K.S. Whiting).

Identification of Sources of Metals in Stream Sediments Using Electron Microprobe Techniques. Presented at Tailings and Mine Waste Conference, January 13-17, 1997. (With K.S. Whiting).

Aerobic Bioremediation of TCE-Contaminated Groundwater. *Bioremediation*. 4(4):513-518. 1997.
(With A.W. Bourquin, D.C. Mosteller, M.J. Smith, and K.F. Reardon).